POWERINK
Power Systems

DIESEL GENERATING SETS

WPS20S

Your Partner for Power...

NOISE LEVEL: 59.3dBA@7m

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Manufacturing standards and environmental conditions

Design Standards

The designs and the productions are in conformity with:

- Conformite Europeenne (CE)
- China Compulsory Certification (CCC)
- ISO8528-1995
- GB/T2820-1997

Environmental Operating Conditions

- Installation place: Outdoors or indoors (well ventilated).
- Ambient temperature: -25℃ to 45℃.The coolant heater is needed when the temperature is below 5℃
- Humidity: Less than 80%.
- Altitude: Below than one thousand (1000) meters above sea Level.

Factory Inspection

- Inspection items.
- Protection devices working test.
- Starting ability in normal temperature.
- 50% rated power load moment capability.
- Voltage deviation and speed variation: 0%, 25%, 50%, 75%, 100%, 110% Load.

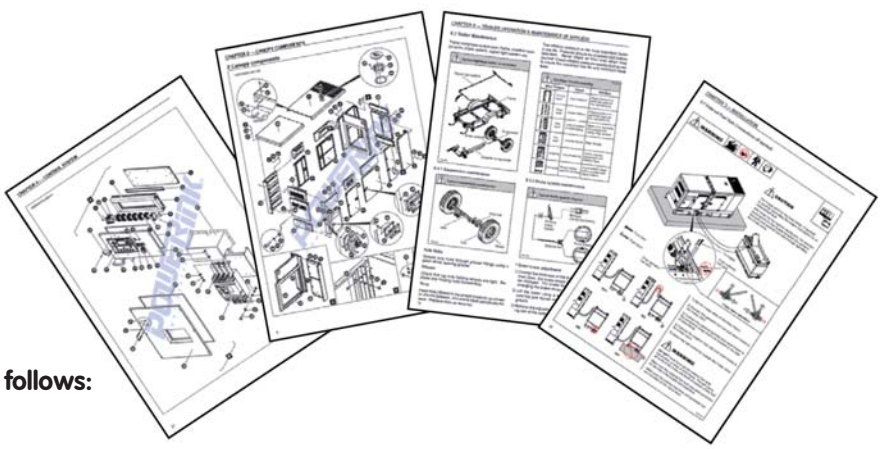
Painting Process

- Painting process specifications and colors are based on the manufacturer’ s standard.
- The customer could also choose the color which the manufacturer offers.

Technical documents and materials with the genset

Relevant materials with the genset as follows:

- Certificate of Conformity
- Test Report
- Maintenance Manual
- Warranty Service Manual
- Installation Manual of Genset
- Circuit Diagram of Genset
- Certificate of Origin of Diesel Engine
- Installation and Maintenance Manual of Diesel Engine
- Installation and Maintenance Manual of Alternator



Optional technical materials for genset as follows:

- Three-view Drawing of Genset
- Technical Specifications
- Parts Manual of Genset
- Parts Manual of Diesel Engine
- Operation Instructions of Control System Module

POWERLINK also provides parts list, specifications, engineer handbook etc. Contact POWERLINK for complete information or technical support through the website, phone, fax, or email if you encounter a problem when using your product or product documentation.

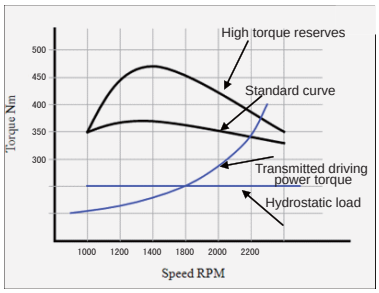
Product Features

Strong Power,
Stable Performance

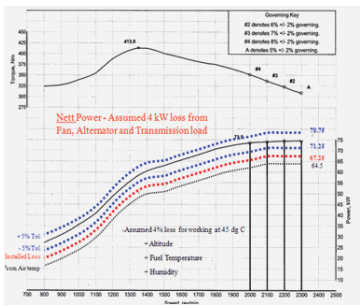
ENGINES AND ALTERNATORS

- Excellent engines and alternators featured with strong power, high torque, quick start, easy maintenance and operation.

High torque reserves



Ultra-low power loss



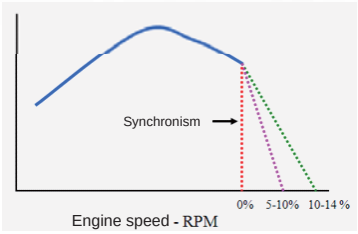
HIGH QUALITY STEEL AND PAINT PROCESS

The canopies are made of high quality steel and powder coated. The paint is highly endurable against erosion and scratch, and strongly rustproof.

ADVANCED WATERPROOF AND DUSTPROOF DESIGN

The control panel, service doors and canopy board adopt waterproof and dustproof design, which can effectively stops rain and dust intrusion.

Excellent speed governing control



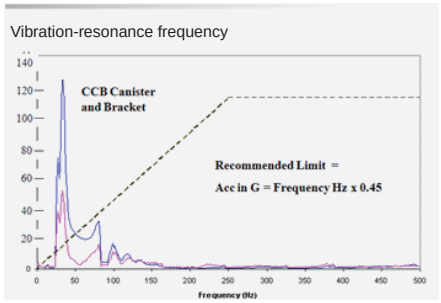
COMPACT STRUCTURE

Compact structure, small size, and longer service life.

EXCELLENT ANTI-VIBRATION DEVICES

- Anti-vibration mountings between the engines, alternators and the base significantly reduce the vibrations during operation, ensuring stable operation.
- All movable devices are fixed firmly, and therefore help reduce vibration.

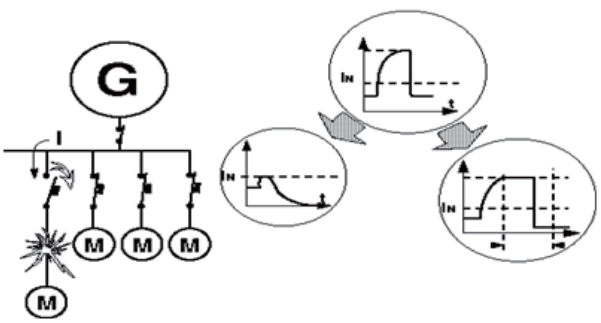
Scientific suspension system design



Enhanced Safety

ELECTRIC SAFETY

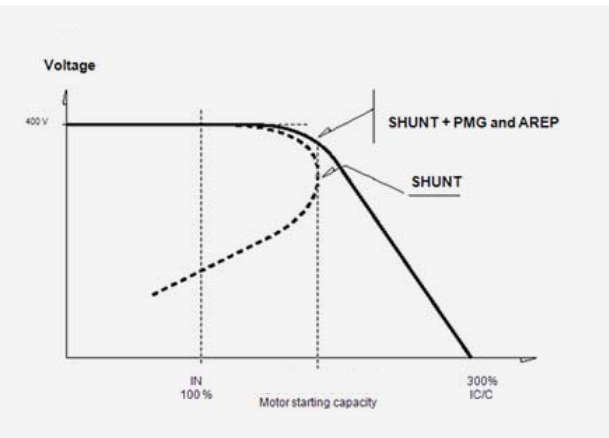
- The double protection for the cable connection panel lowers the probability of leakage caused by unintended touch or rain falling.
- Three-dimensional CABLING design for all the generator cables, providing reasonable, accurate and perfect protection.
- Automatic turn-on circuit breaker with undervoltage protection system inside maximally avoids human misoperation.
- Automatic control module for multi-directional monitoring meets multilevel demands and considerate protection of or for customers.



Short circuit current diagram

OPERATION SAFETY

- The radiator and high-voltage parts are guarded to avoid accidents caused by touch.
- The control panel is lockable. Current changeover switch, voltage regulator and circuit breakers are installed behind the door.
- Anti-vibration rubbers are installed in the two sides of the doors to avoid damage to the machines when open the doors.
- Lockable fuel filling cap.

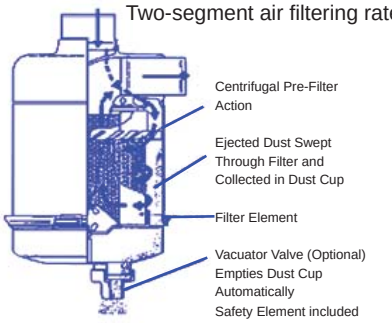


Genset overload diagram

Environmental

POWERFUL ENGINES

- Adopts world-famous engines , with low noise and low emission.
- Rigid structure ensures lowest vibration.


Two-segment air filtering rate
Centrifugal Pre-Filter Action
Ejected Dust Swept Through Filter and Collected in Dust Cup
Filter Element
Vacuator Valve (Optional) Empties Dust Cup Automatically
Safety Element included

- Common rail system: (for some models) significantly lowers the combustion temperature, and also leads to cleaner exhaust.
- For the turbocharged machines, the carbon dioxide (CO_2) emission is reduced.

EXCELLENT SILENCERS

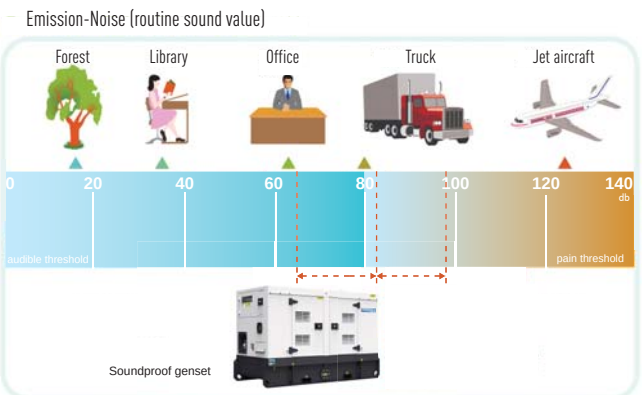
Silencer and muffler pipe system dramatically reduce the noise during operation, and therefore cause less effect on daily life.

HIGH QUALITY SOUND ABSORBING MATERIAL

The interior is lined with new type fire retardant and sound absorbing cotton, and the door is airproof with rubber specific for car doors use only, which helps absorb massive noise and heat during the operation.

FULLY-CLOSED NOISE REDUCTION

Besides applying airproof rubber around the doors, the concept of noise reduction has also been fully integrated into the inlet/outlet and other aspects.



Product Features

Easy to Operate

CONTROL SYSTEM

- Micro-processor cored digital system.
- Multiple languages for option, automatic control.
- Connected with the mains through ATS, which can help realize automatic transfer between the mains and the generators. Also, multiple generators can be paralleled for bigger power need.

CONVENIENT REFUELING AND WATERING INSTALLATIONS

- Outer filling fuel port.
- 8-12 hours base fuel tank in soundproof generator sets prevent against leakage and fuel spray when cleaning the interior. The fuel tank abides by European environment protection standards
- Drainage outlet.
- Water feeder is located on top of the canopy;

CONVENIENT CONNECTION

- Terminal connection lugs (L1, L2, L3, and LN) make connection and wiring more simple and well-ordered.
- Emergency stop provides convenient operation in emergent situation and when servicing.

EASY TO TRANSPORT

- The machines below 500kVA have holes for forklift and dragging in the base for easy transport.
- Lifting eyes located on top of the canopy make easier move by cranes.

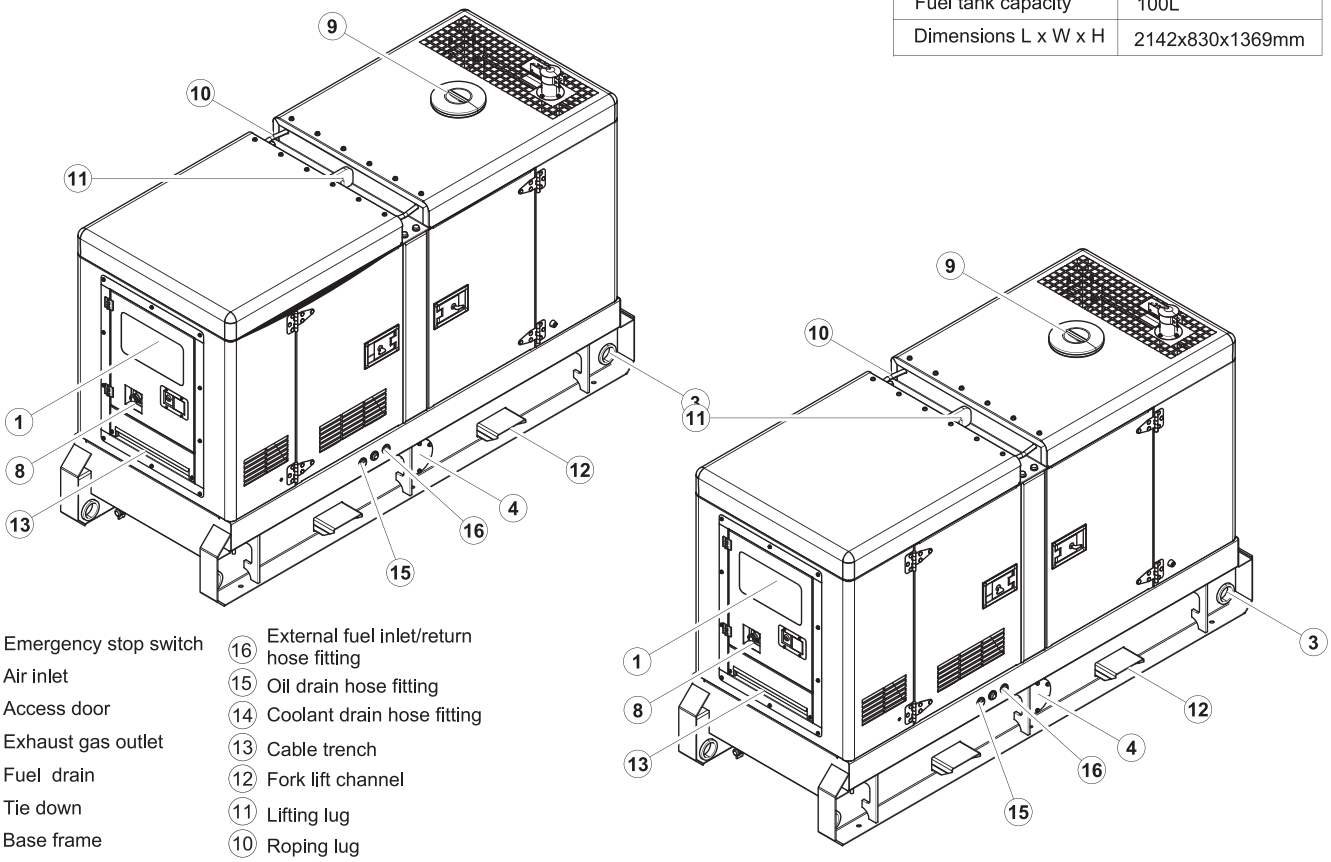
EASY TO MAINTAIN

- The daily maintenance work can be performed on both sides of the machine, and wide door allows you easily get in touch with the machine.
- An integral waste drainage outlet located at the bottom of the machine makes easier regular maintenance.
- For generators above 300kVA, a ladder for climbing is equipped. It makes easier to check and service.

Product configuration–WPS20S

1000020900-DR1-A6

Dry weight	968.7kg
Fuel tank capacity	100L
Dimensions L x W x H	2142x830x1369mm



8 Emergency stop switch
7 Air inlet
6 Access door
5 Exhaust gas outlet
4 Fuel drain
3 Tie down
2 Base frame
1 Control cabinet
16 External fuel inlet/return hose fitting
15 Oil drain hose fitting
14 Coolant drain hose fitting
13 Cable trench
12 Fork lift channel
11 Lifting lug
10 Roping lug
9 Coolant inlet

Configuration

Genset Model		WPS20S
Engine	4 stroke water-cooled Diesel engine	●
	Industrial Silencer	●
	Switch in the Negative Pole	●
	Oil Sump Pump	●
	Water Jacket Preheater 220/240V	○
	Oil Preheater	○
	Standard Air Filter	●
Altarnator	PMG	○
	Anti-condensing Heater	○
	Winding Temperature Measuring Instrument	○
	IP23 Single Bearing,Class H insulation	●
	Alternator Preheater	○
	AVR	●
Cooling Systems	Radiator for 45℃	●
	Coolant Integrated with genset	●
	Coolant Protection Port	●
	Shelter of Water Tank	●
Starting Systems	Start-up and Charging	●
	Batteries with cables and Switch	●
	Protecting Jacket of Solenoid Terminal	●
Control Systems	Battery Charger	○
	Key Start	●
	AMF	○
	Paralleling	×

Genset Model		WPS20S
Fuel Systems	Breather Valve	●
	Fuel Level Sensor	●
	Fuel T-valves	○
Canopy and Soundproof Configuration	Outside Refueling	●
	Outside Watering	●
	Rainhat of Hush Pipe	●
	Lifting Lugs	●
	Shock Absorbers	●
	Emergency stop button Outlaid	●
	Control Cabinet with windows and doors	●
	Air Inlet	●
	Air Outlet	●
	Silencer	●
Bases	Base Fuel Tank	●
	Holes for Forklift	●
	Pulling slots	●
	Wiring hole	●
	Earthed Protection	●
	Drain Outlet	●
Materials with Gensets	Parts Manual	●
	Operation manual	●
	Warranty manual	●
	Records notebook of Maintenance	●

Standard: ● Optional: ○ Impossible: ×

Optional

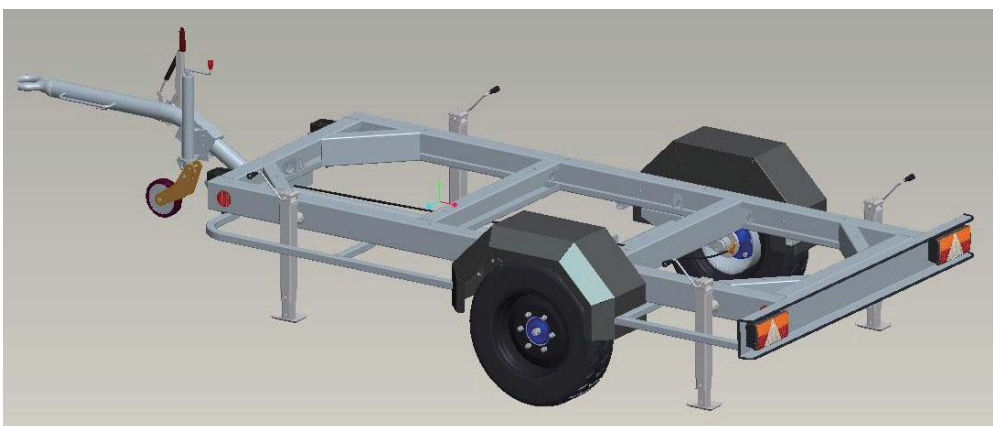
Engine	Alternator	Generator Set	Fuel System	Canopy
• Water Jacket Preheater • Oil Preheater	•Winding Temperature Measuring Instrument •Alternator Preheater • PMG • Anti-damp and anti-corrosion treatment • Anti-condensation heater	• Tools with the machine	• Low fuel level alarm • Automatic fuel feeding system • Fuel T-valves	• Trailer

Lubricating System	Exhaust System	Cooling System	Control Panel	Voltages
• Oil with the machine	• Protection board from hotness	• Front heat protection • Coolant (-30°C)	• Remote control panel • PLC-7320 • PLC-702HC • ATS	• 415/240V • 400/230V • 380/220V • 220/127V • 200-115V

Trailer Plate

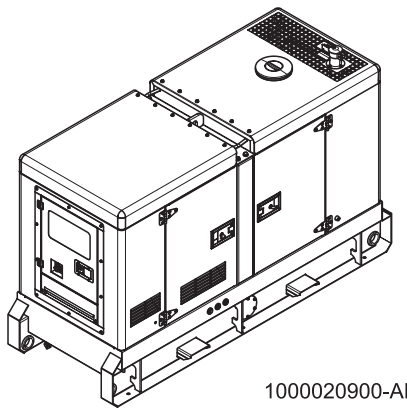
Road Standard

Off-road Standard



Genset specification

General technical data

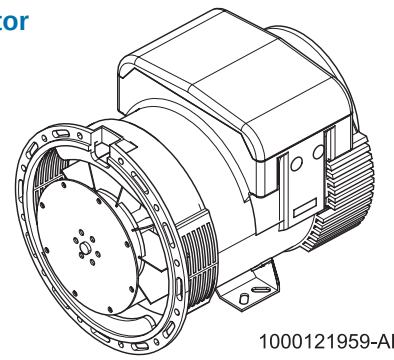


1000020900-AP1-A6

Model WPS20S
Structure type ..... R
Tank capacity 100L
Dry weight 968.7kg
Noise level @7m 59.3dBA
Dimensions L×W×H 2142x830x1369mm
Standby Power 22kVA/18kW
Prime Power 20kVA/16kW

Voltage	380V	400V	415V
Ampere	30.4A	28.9A	27.8A

Alternator

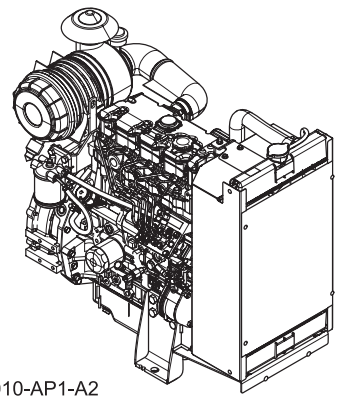


1000121959-AP1-A3

Alternator Manufacturer/Brand ..... Leroy Somer
Alternator Model LSA40M5
Exciter ..... Brushless

Cooling Fan ..... Cast alloy aluminum
Windings ..... 100% copper
Insulation Class ..... H
Winding Pitch 2/3
Terminals 12
Drip Proof IP23
Altitude ..... ≤1000m
Overspeed 2250rpm
Air Flow ..... 0.06m³/s(50HZ),0.072m³/s(60HZ)
Voltage Regulation ..... ±1.0%
Total harmonic TGH / THC at no load < 3 % - on load < 2%
Telephone Interference ..... THF<2%;TIF<50

Diesel engine



1000090010-AP1-A2

Engine Manufacturer/Brand ..... Perkins
Engine Model 404D-22G
Dimensions L×W×H ..... 915×477×840mm
Dry Weigh (approx.) 242kg
Number of Cylinders 4
Bore 84mm
Stroke 100mm

Displacement 2.216L
Compression Ratio 23.3
Type of injection ..... Indirect injection
Intake System ..... Natural aspirated
Intake Resistance ..... ≦6.4kPa
Cooling System ..... Water cooled
Fan ..... Pusher
Battery Voltage 12V
Type of Fuel EPA2D 89.330-96/CEC RF-06-99
Type of Oil ..... API-CH-4/ ACEA E5
Oil Capacity 10.6L
Type of Coolant ..... Glycol mixture
Coolant Capacity 7.0L
Back Pressure ..... ≦10.2kPa
Standby Power 20.6kW
Continuous Power 18.7kW
Fuel Consumption(100%load) 243g/kWh

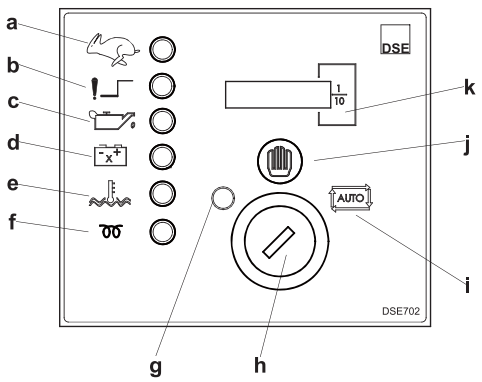
Control System

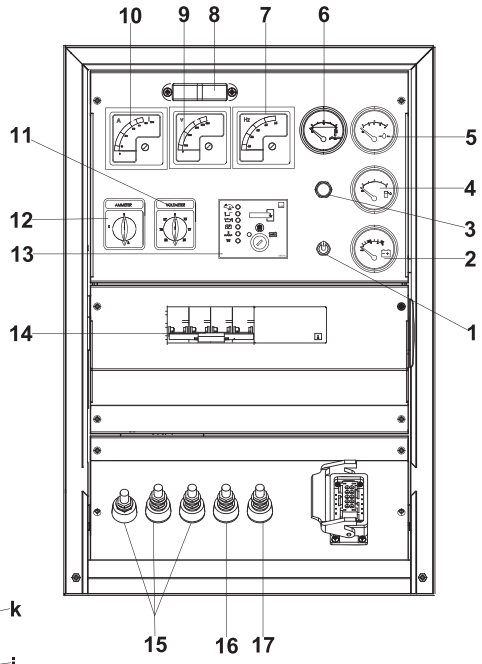
PLC-702HC

The PLC-702HC Key Manual Start Module is a Manual Engine Control Module designed to control the engine via the key switch and pushbuttons on the front panel. The module is used to start and stop the engine and indicated fault conditions, automatically shutting down the engine and indicating the engine failure by LED, giving true or fault annunciation.

STANDARD CONTROL FUNCTION

- Manual Engine Control Module
- Wide DC Input Range
- Protection and Indication of Low Oil Pressure, High Engine Temperature and Overspeed
- Charging Failure Warning without Stop
- Auxiliary Shutdown
- Speed Indication Transferred from Frequency
- Warning Display LED
- Run-hour Timer
- Built-in Frequency Toggle Switch (50/60Hz)
- Indication of Fuel, Start-up, Preheating and Shutdown





a Over speed protection LED
b Alarm LED
c Low oil pressure protection LED
d Charge failure warning LED
e High engine temperature protection LED
f Pre-heat LED
g Stop model position
h Control module key switch
i Auto start position
j Manual start button
k Time counter

1 Control cabinet lamp switch
2 Battery voltage meter
3 Charge indicator
4 Fuel level meter
5 Oil pressure meter
6 Water temperature meter
7 Frequency meter
8 Control cabinet lamp
9 Voltage meter
10 Current meter
11 Voltmeter change-over switch
12 Ammeter change-over switch
13 Control module
14 Main circuit breaker
15 Live wire terminals
16 Neutral wire terminal
17 Ground wire terminal

		MODEL	PLC-702HC	PLC-7320
General accessory		AVR	●	●
		Electronic Governing	×	×
		Glow plug control	●	●
		Cycle Cranking	●	●
		(MODBUS) Networking	×	●
		Fault History	×	●
Operator Interface		manual start/stop	●	●
		Auto/remote start	●	●
		Regular Test	×	●
		Auto operation LED	×	●
		Manual operation LED	×	●
		Common Shutdown LED	●	●
		Common warning LED	●	●
		Fail to start LED	●	●
		Emergency stop(local)	●	●
		Alphanumeric screen	●	●
		Remote start input active LED	×	●
		Fault reset	●	●
Measurement and Instrumentation	Engine	oil pressure	●	●
		Water Temperture	●	●
		Engine Speed	●	●
		Hours Run	●	●
		Number of Starts	●	●
		Battery Voltage	●	●
		Exhaust Coolant Temperature	○	●
	Alternator	3Phase(L-L Voltage&Frequency	●	●
		3phase Current	●	●
		Frequency	●	●
		kWh	×	●
		Apparent Power	×	●
		Active Power and Inactive Power	×	●
		Power Factor	×	●
		Per PhaseKVA,KW	×	●
		Per Phase Kva	×	●
		Phase Voltage	○	●
		Output Power	×	●
	Mains Expression	Grid Wire Voltage	×	●
		Grid Phase Voltage	×	●
		Grid Frequency	×	●
Shutdown Protection and Indication	Engine	Low Fuel Level	×	●
		High Fuel Level	×	○
		Low Oil Pressure	●	●
		High Water Temperature	●	●
		Failure to Stop	×	●
		Failure to Start	●	●
		Controlable start circles/times	×	●
		Overspeed	●	●
	Alternator	Under&Over Voltage	×	●
		Under&Over Frequency	×	●
		Overcurrent	×	●
		Earth Leakage	○	○
		Reverse Power	×	×
		Reverse Var	×	×
Threshold Warning&Indication		Low Oil Pressure	●	●
		Low Water Temperature	×	○
		High Water Temperature	●	●
		Low Water Level	×	●
		Low/High Battery Voltage	×	●
		Failure to Charge	●	●
		Overcurrent	×	●
		Overload	×	●
		Genset under/over Voltage	×	●
		Genset under/over Power	×	●
		under/over Speed	×	●
		High Engine Temperature	●	●
		Earth Leakage	×	●
Paralleling Capability		Synchroscope(Independent Wire)	×	×
		Active and Inactive Power Transfer Function	×	×
		Synchroscope(Shared Wire)	×	×
		Synchronization Dector	×	×
		Peak Lopping	×	×
Power Transfer Function		Automatic Transfer	○	●
		Hard Closed Transition	●	●
		Soft Closed Transtion	×	×
		Gen/Mains Breaker	×	●
		Gen/Mains Breaker Status Protaction	×	●
		Speed/Voltage Control	×	×
		Power Indication	×	●
		Fuel&solenoid valve Control	●	●
		Startor Control	●	●
		Preheating	○	○
		Mains Transfer Switch (Standard)	×	●
		Mains Transfer Switch (Emergency)	×	●
Environment		Ambient temperature (-40℃-70℃)	●	●
		Ambient humidity (-25℃-45℃)	●	●
		Humidity≤80%	●	●
Monitoring Function		Grid Over/Under Voltage Control	×	●
		Grid Over/Under Frequency Control	×	●
		Controller Input/ Output(Warning/No-load)	×	●
		Optional Eletrical Appliances Output	×	●
		Telegram Distance Control with all functions	×	●
		Engine Instrument Monitoring	×	●
		Alternator Output Instrument Monitoring	×	●
		Connection Point with all-round Setting for 8 Users	×	●
		4Users input Connection Point	×	●
		Led Light Control of Low Light Operation Environment	×	●
		Safe PIN Code	×	●
		Interface RS232/485	×	●
		Control Panel with all-function Button including Language Selection	×	●
		Muiti-Language Function	×	●

● Standard ○ Optional × Impossible

Control System

Digital, intelligent control system allows easier operation.

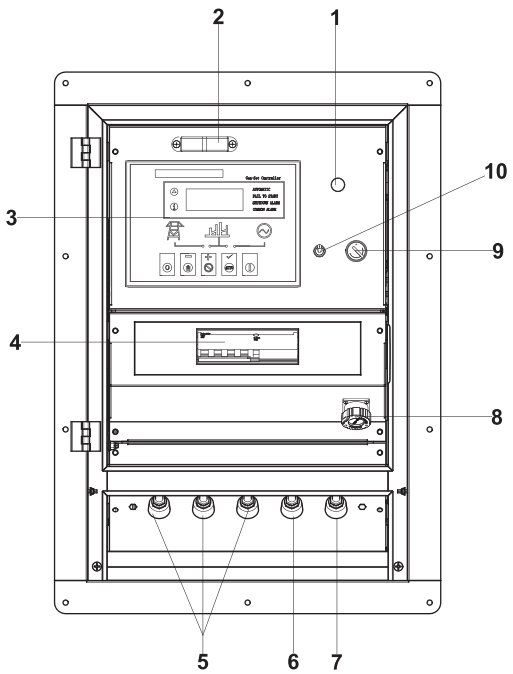
PLC-7320

Powerlink PLC-7320 generator controllers integrating digital, intelligent and network techniques are used for automatic control system of diesel generator. It can carry out functions including automatic start/stop, data measure and alarming.

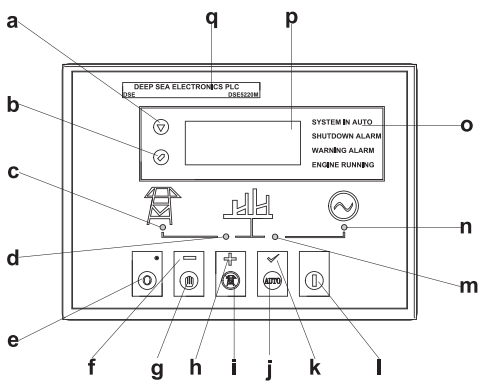
Upon detection of a mains (utility) failure the module automatically starts the generating set. Once the mains (utility) power has been restored it instructs the generating set to stop.

FEATURES

- Microprocessor control, with high stability and credibility .
- Mains supply and generator operation monitoring.
- Indicating operation status and fault conditions.
- Multiple protections; multiple parameters display, such as pressure, temperature.
- Manual and automatic work mode selectable.
- Real time clock for time and date display, overall runtime display, 99 log entries.
- Overall power output display.
- Integral speed/frequency detecting, telling status of start, rated operation, overspeed.
- Communication with PC via RS485 or RS232 interface, using MODBUS protocol.
- Engine ECU is available.
- Common USB cable is usable for parameter configuration.
- Multi-language is available. It can be translated for only one time and imported in forever. The idiom can also be changed after translation, eg. "Failure" to be "Malfunction".



1	Charge indicator	6	Neutral wire terminal
2	Control cabinet lamp	7	Ground wire terminal
3	Control module	8	ATS connector
4	Main circuit breaker	9	Key switch
5	Live wire terminals	10	Control cabinet lamp switch

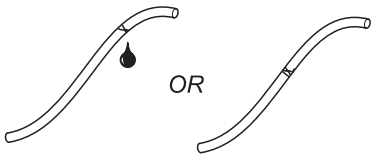


a	Scroll button
b	Information button(Change the display page)
c	Mains supply available LED
d	Mains supply on load LED
e	Stop/Reset button
f	Decrease (Configuration mode only)
g	Manual button (Manual control mode)
h	Increase (Configuration mode only)
i	Test button (Test mode)
j	Auto button (Auto mode)
k	Accept (Configuration mode only)
l	Start button
m	Genset on load LED
n	Genset available LED
o	Text insert
p	LCD display
q	Control module name

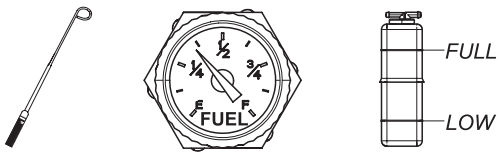
Routine Maintenance Diagram

GS-MT16

Daily or After **8** Hours

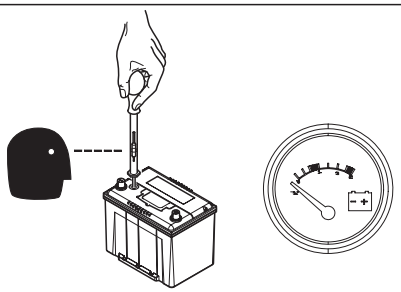


Check hoses for leak (oil, fuel and coolant) or crack

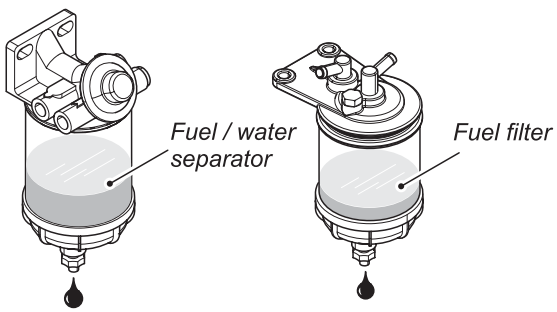


Check various meters and alarm lamps
check engine oil, fuel and coolant level

Monthly or After **100** Hours

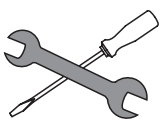


Check battery charging system

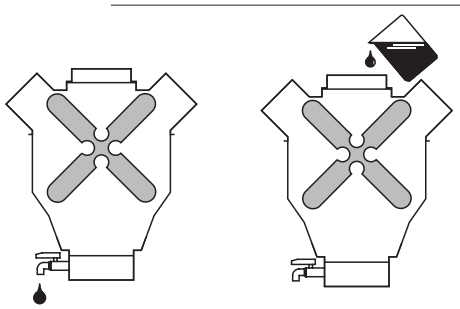


Drain water/sediment in fuel/water separator
Drain water/sediment in fuel filter

6 Months or After **250** Hours

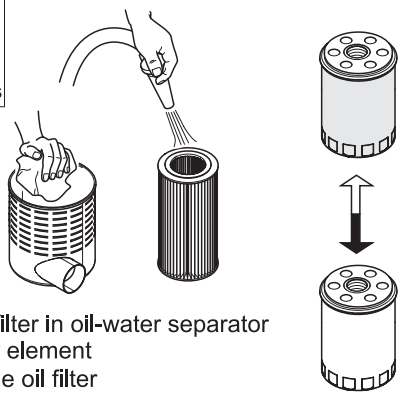


Tighten all electrical connections



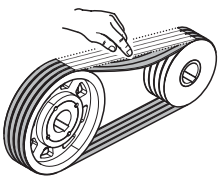
Change engine oil

6 Months or After **250** Hours

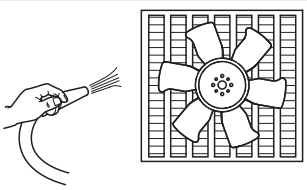


Clean gauze filter in oil-water separator
Clean air filter element
Change engine oil filter
Drain water/sediment in fuel tank

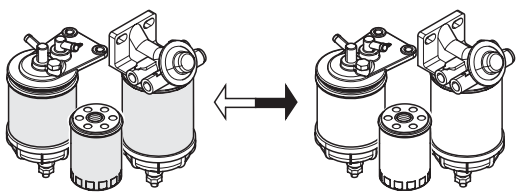
1 Year or After **500** Hours



Check drive belt tension

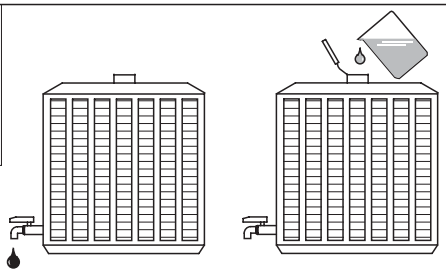


Check and clean cooling system



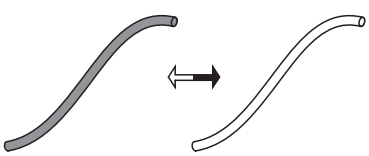
Change fuel filter
Change air filter element
Change gauze filter in oil-water separator

2 Years or After **1000** Hours



Change coolant

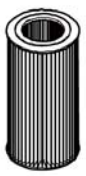
Clean the inside
of the fuel tank

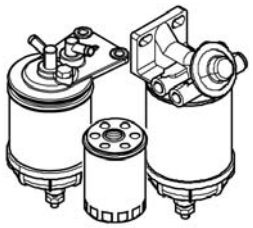


Change oil and fuel pipes

Common Maintenance and Repair Parts (optional)

POWERLINK also provides spare parts such as filters, water-oil separators, oil filters or any other part if necessary.





The following lists are optional by the needs of customers.

Engine Model:404D-22G

Minor Repair / 1000 hrs optional

No.	Part Name	Part No.	Q'ty	Remark
1	Fuel Filter	26561117	6	
2	Oil Filter	140517050	6	
3	Air Filter	135326206	5	
4	BELT	080109107	1	
5	SEAL - ROCKER BOX COVER	111996401	1	
6	GASKET - CYLINDER HEAD	111147711	1	
7	THERMOSTAT	145206230	1	
8	FRONT OIL SEAL	198636160	1	
9	SEAL - REAR END OIL	050209083	1	

POWERINK
Power Systems

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PowerLink reserves the right to make changes in model,
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Please contact the salesman before ordering.

EP Series / Mar.2011, Edition 6220003